ATTACHMENT 1

Site Map and New Locations for Outfalls 003 and 004

To demonstrate the flow path of any permitted Allowable Non Storm Water discharge, locate the area where the discharge occurred on this map. The following list are the permitted Allowable Non Storm Water discharges:

- Discharge from fire fighting activities;
- Fire Hydrant Flushing;
- Potable water including water line flushing;
- Uncontaminated air conditioning or compressor condensate;
- Irrigation drainage;
- Landscape watering provided all pesticides, herbicides, and fertilizer have been applied in accordance with manufacturer's instructions;
- Pavement wash water where no detergents are used and no spills or leaks of toxic or hazardous materials have occurred (unless all spilled materials has been removed);
- Routine external building wash down which does not use detergents;
- Uncontaminated ground water or spring water;
- Foundation or footing where flows are not contaminated with process materials such as solvents;
- Incidental windblown mist from cooling towers that collects from rooftops or adjacent portions of the facility, but not intentional discharge from the cooling tower (e.g. "piped" cooling tower blowdown or drains).

LEGEND

- RAILROAD
- FENCE
- DITCH FLOWLINE
- DITCH FLOWLINE
- TOP OF SLOPE
- TOE OF SLOPE
- SPCC BULK STORAGE
- SPCC OIL-FILLED MECHANICAL EQUIPMENT
- SPCC OIL-FILLED ELECTRICAL EQUIPMENT
- DRAINAGE
- DRAINAGE AREA (APPROXIMATELY 8.1 ACRES) FOR OUTFALL 001. APPROXIMATELY 70% IMPERVIOUS SURFACES.
- DRAINAGE AREA (APPROXIMATELY 4.9 ACRES) FOR OUTFALL 002. APPROXIMATELY 70% IMPERVIOUS SURFACES.
- DRAINAGE AREA (APPROXIMATELY 7.9 ACRES) FOR OUTFALL 003.
- DRAINAGE AREA (APPROXIMATELY 3.0 ACRES) FOR OUTFALL 004.
- SHEET FLOW OFFSITE.

GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)
1 inch = 80 ft.

REV	DATE	DSGN	DRWN	CHKD	DSGN SUPV	PROJ ENGR	CIVIL ENGR	ELEC ENGR	MECH ENGR	ARCH	E.M. ENGR	I&C ENGR
4	5/16 2011	–	KTC	RAW	RWM	–	–	–	–	–	–	–
3	3/04 2011	–	KTC	RAW	RWM	–	–	–	–	–	–	–
7	2/21 2014	–	JDS	–	–	–	–	–	–	–	–	–
6	9/6 2012	–	KTC	RAW	RWM	–	–	–	–	–	–	–
5	6/24 2011	–	KTC	RAW	RWM	–	–	–	–	–	–	–

4 REVISED PER ENVIRONMENTAL REDLINE.

3 REVISED PER ENVIRONMENTAL REDLINE. ADDED SWPPP, NOTES AND OUTFALLS.

7 REVISED TO INCLUDE NEW DRAINAGE AREAS

6 REVISED PER ENVIRONMENTAL REDLINE. DETACHED HW-0-SP-STA-621 REFERENCE.

5 REVISED PER ENVIRONMENTAL REVIEW. ADDED "S" SERIES NUMBERS.

DOMINION ENERGY"

FOSSIL & HYDRO TECHNICAL SERVICES
RICHMOND, VIRGINIA

SITE PLAN
STORM WATER DRAINAGE

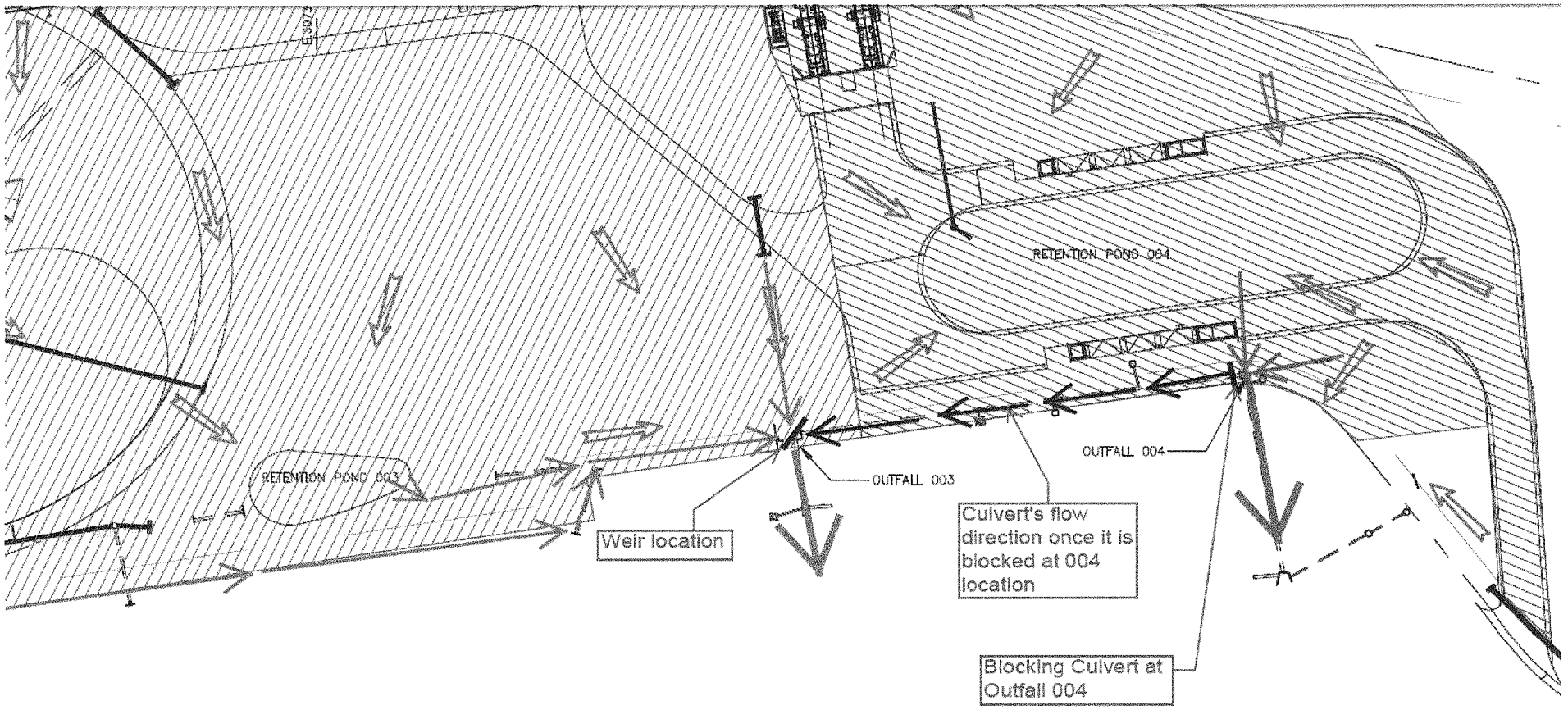
HOPEWELL POWER STATION

DSGN –	DSGN SUPV –		
DRWN SWC	ENGR SUPV –	DRAWING NUMBER	REV.
CHKD RAW	PROJ ENGR –	HW-0-SP-STA-622	7
DISPL ENGR –	SCALE:1" = 80' UNLESS OTHERWISE NOTED		SH 1 OF 1

Hopewell Power Station - Evaluation of Offsite Drainage Culvert and Controls

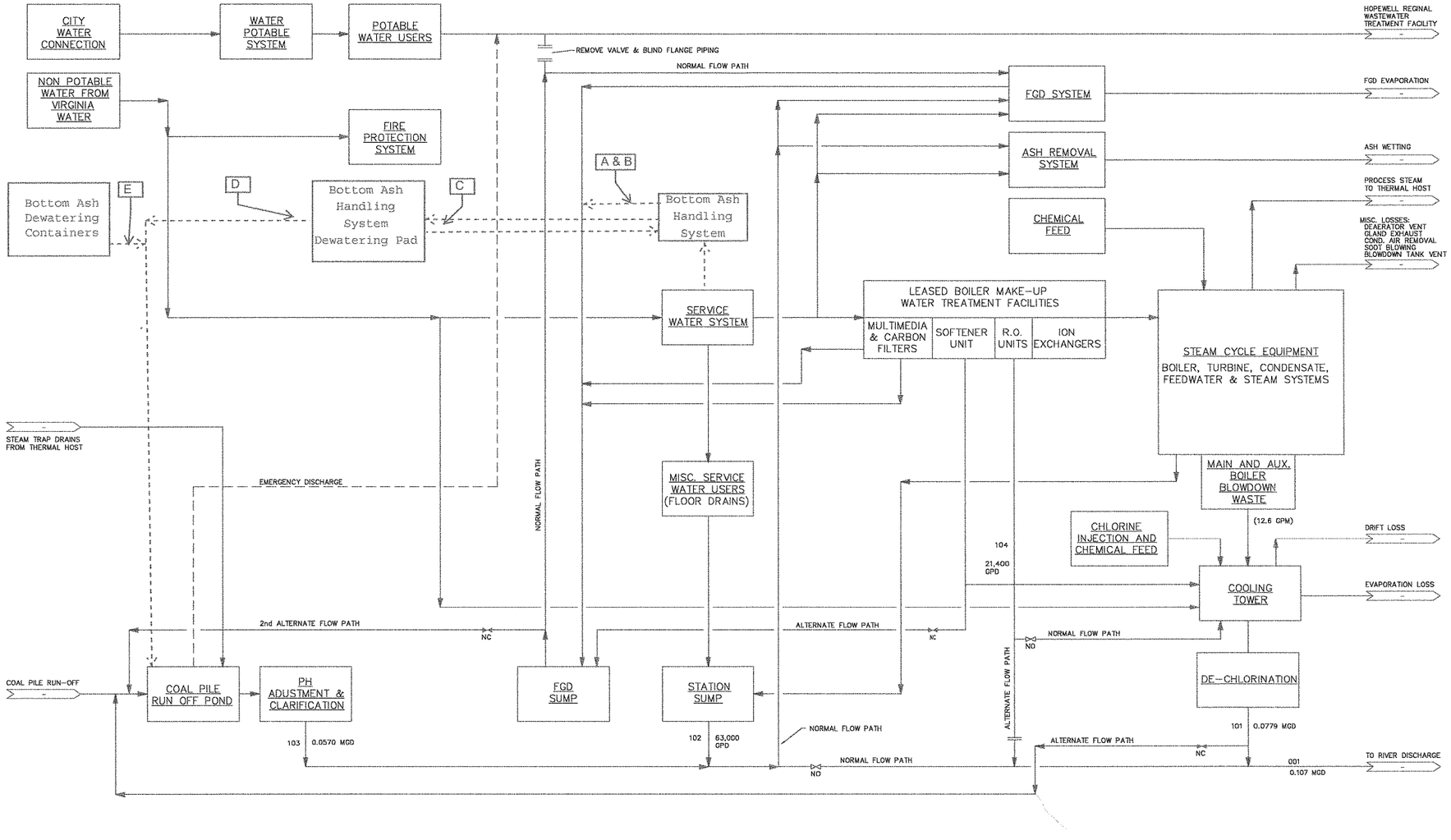
September 29, 2014

The following information is providing an update on the observations of the water flow from the culvert pipe located in drain inlet's sump which is the proposed sampling location for storm water Outfall 004. Station personnel performed a float test during a storm event and discovered that the culvert pipe in the "Outfall 004" runs parallel with the property boundary and daylights at the proposed storm water Outfall 003's sampling location. In efforts to eliminate offsite influences on samples collected at the proposed storm water Outfall 004 location, the culvert will be blocked. (Note, the culvert currently has a temporary blocker in place as we evaluate this option to ensure no issues arise due to blocking it.) All future offsite flows captured within the culvert (neighboring road drains) will then be directed to the proposed storm water Outfall 003 sampling location. As discussed during the September 5th site visit, a weir has now been installed at the proposed sampling location for storm water Outfall 003 which will allow Dominion to collect a better representative sample for Outfall 003's drainage area. The following diagrams are provided to represent how the offsite run-on will be controlled at both Storm Water Outfalls 003 and 004.



ATTACHMENT 2

Updated Facility Description



LEGEND:

001, 101, 201, ECT. } DISCHARGE STREAMS ARE REFERENCED IN PERMIT APPLICATION

NC – NORMALLY CLOSED

NO – NORMALLY OPEN

NOTES:

1. UNLESS OTHERWISE NOTED ALL FLOW RATES ARE IN GPD WITH THE PLANT OPERATING AT MAXIMUM LOAD.
2. FLOWS ARE CONTINUOUS EXCEPT THOSE WHICH HAVE ENTRIES ON FOURTH LINE IN TABULATION.

REV	DATE	DESCRIPTION
3	8/9/2012	REVISED PER REDLINE REQUEST. REMOVED SUMP STATION, ADDED FLOW ARROW AND MODIFIED 63,000 GPM TO GPD.
2	6/13/2012	CONVERTED TO 600 SERIES ACAD DRAWING PER ENVIRONMENTAL REDLINE.

FOSSIL & HYDRO TECHNICAL SERVICES
RICHMOND, VIRGINIA

ONE LINE DIAGRAM WATER FLOW BALANCE LINE DIAGRAM HOPEWELL POWER STATION

DSGN	DSGN SUPV RWM		
DRWN TTT	ENGR SUPV	DRAWING NUMBER	REV.
CHKD CKS	PROJ ENGR	HW-0-SP-STA-600	3
DISPL ENGR	SCALE: N/A UNLESS OTHERWISE NOTED		SH 1 OF 1

Bottom Ash Handling Systems (BAHS)

- Description of the BAHS Discharges;
- Revised VPDES Flow Balance Diagram; and,
- BAHS Discharge Characterization Data.

Bottom Ash Handling System (BAHS) Description

Per DEQ's Adam Eller email dated April 29, 2014, the Bottom Ash Handling System is allowed to send the deminimus BAHS water to the Flue Gas Desulfurization (FGD) system where it can be utilized in emissions and ultimately evaporated, no discharges generated. To date, the FGD system has been able to manage the deminimus BAHS water without require the need to discharge. In evaluating various VPDES associated possibilities, Dominion has provided the following summaries to describe each water source associated with the BAHS. I have attached a revised Hopewell Power Station VPDES Water Balance diagram which indentifies BAHS revisions with the red lines and text. The alpha numeric identifications correspond to with the below descriptions.

A

The maximum average daily deminimus water volume from the BAHS is approximately 75 gallons per day, which will be sent to the FGD Sump where it will be used in the FGD System's emissions. Should the water in the FGD Sump need to be discharged, the water FGD sump will send the water to the previous coal pile runoff pond. Discharges from the previous coal pile runoff pond receive pH adjustments and is permitted as VPDES internal Outfall 103. Outfall 103 is one of four internal outfalls which make-up Outfall 001.

B

When the BAHS requires maintenance, the associated sumps will need to be drained. The total estimated volume for draining the BAHS is 4800 gallons per event, which will be sent to the FGD Sump. When the unit is operating, the water in the FGD sump will be used in the FGD System as in emission controls. When the water from the FGD Sump needs to be discharged, the FGD sump water will be sent to the previous coal pile runoff pond, which receives pH adjustments prior to discharging via internal Outfall 103.

C

As part of the BAHS system, the Bottom Ash is removed via a drag chain which transports the bottom ash to a dewatering pad which is located on the exterior of the Main Plant Building. The dewatering pad is equipped with a perimeter drain collection which recycles the water back into the BAHS system. The dewatering pad also is equipped with a roof which is installed to minimize stormwater contact and the volume of water associated with this closed loop is not measured.

D

The area in which the bottom ash dewatering pad is located drains to the previous coal pile runoff pond. Even though the dewatering pad is equipped with a perimeter drain and a roof, Dominion is requesting to have the potential runoff water associated with the dewatering pad be recognized as a contributor to the previous coal pile runoff pond. This would is not expected to occur with any normal frequency and therefore no volumes are predicted.

E

The bottom ash located on the dewatering pad is placed in containers and prepared for offsite disposal. As part of that preparation, the bottom ash containers are held for additional dewatering. The estimated volume of the water generated from the bottom ash container dewatering is 400 gallons per day. The bottom ash dewatering containers are located in the area that drains to the previous coal pile runoff pond. Therefore, Dominion requests that the water associated with this activity be recognized as a contributor to the previous coal pile runoff pond (Outfall 103).

HOPEWELL POWER STATION

(September 2014)

FACILITY DESCRIPTION

The Hopewell Power Station was recently converted from a coal-fired cogeneration facility which was originally designed to produce electricity and steam for sale to local industry to a biomass-fired power generation plant that primarily supplies electrical power. The station temporarily ceased operations during the construction of a biomass (fuel) handling area which is located on adjacent property to the south of the existing facility. Refer to Figure 1 for an aerial view of the existing power station with the biomass handling area outlined.

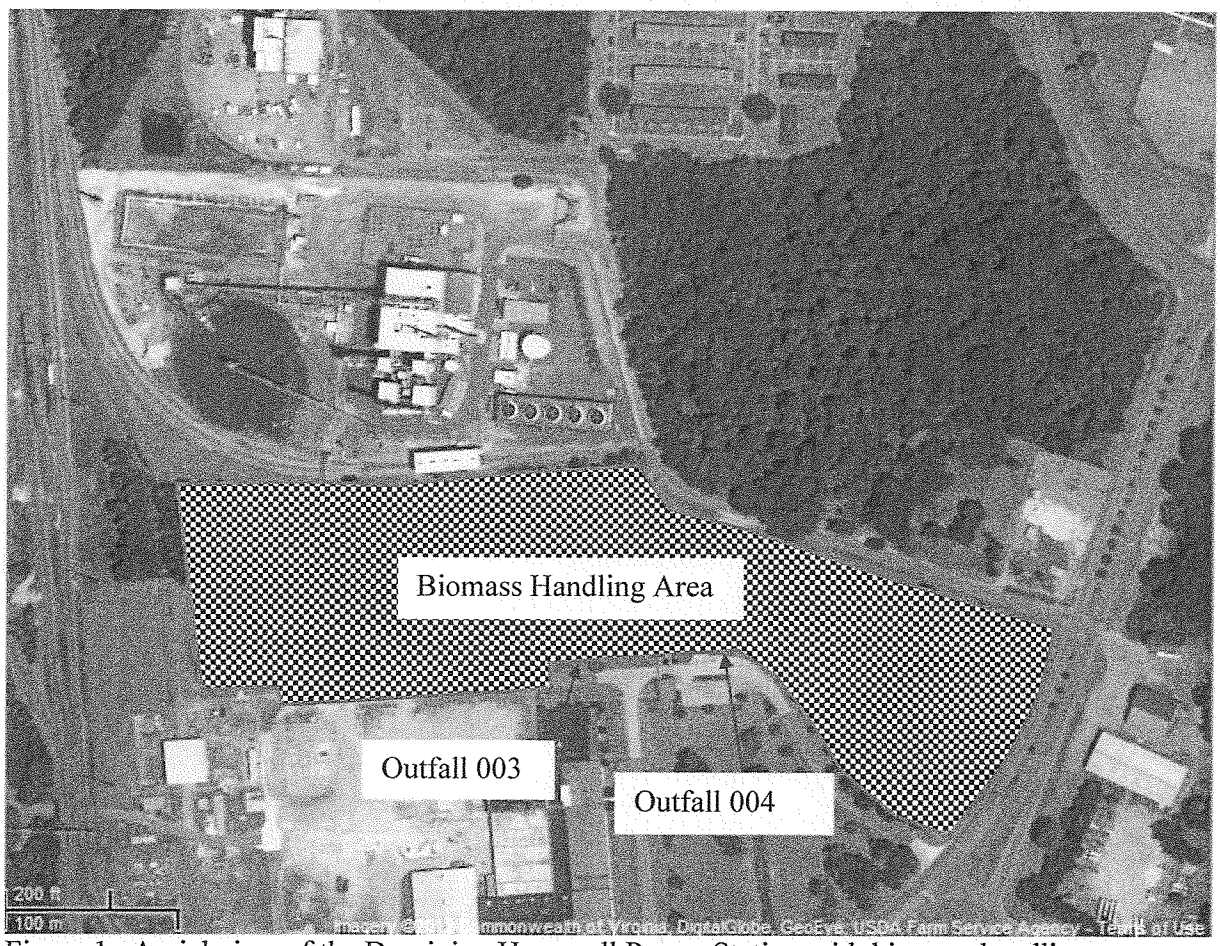


Figure 1. Aerial view of the Dominion Hopewell Power Station with biomass handling area outlined south of the existing plant.

Construction consisted of the removal of existing asphalt parking area and other structures, grading of the site, installation of new storm sewer systems, the construction of a new truck driveway and the construction of biomass handling conveyors and associated equipment. Storm water runoff during construction was diverted to sediment basins or traps. Two stormwater basins were constructed to receive the storm water runoff from the biomass storage area and the vehicular drives.

The coal pile was removed. The coal pile runoff pond is in the process of being cleaned and a new liner installed. The pond will continue to be used in its current capacity.

As of October 18, 2013 the facility began operating as a biomass-fired facility. The station is operating the biomass-fired boilers to generate electricity. Influent water to the station is used for boiler feedwater, cooling recirculation water, and for various plant services. Process wastewater consists of cooling tower blowdown, station sump discharge, holding pond (former coal pile runoff pond) discharge and reverse osmosis reject water. All process streams are combined into Outfall 001 (VPDES permit) which is permitted to discharge to Poythress Run, a tributary to the James River.

DESCRIPTION OF OUTFALLS

The Hopewell Power Station's discharges are permitted by the Virginia Department of Environmental Quality as part of Individual Industrial Minor VPDES Permit No. VA0082783. This VPDES permit combines both industrial wastewater and storm water discharges. The facility has one wastewater outfall (Outfall 001) that discharges to the Poythress Run, a tributary that flows to the James River. Outfall 001 is a collection of internal discharges (Outfalls 101, 102, 103, and 104) that each have their own monitoring requirements.

Outfall 001 is located in the Poythress Run approximately one mile downstream of the facility. Outfall 001 receives discharge from the following internal outfalls:

- Outfall 101: Cooling Tower Blowdown and Boiler Blowdown
- Outfall 102: Low Volume Wastewater (Station Sump/Oil Water Separator Discharge)
- Outfall 103: Holding Pond (previously Coal Pile Runoff pond), FGD System, and Bottom Ash Handling System (BAHS).
- Outfall 104: Low Volume Wastewater (Reverse Osmosis Reject)

If the holding pond is full, or if the current weather may cause the pond to overflow, then in addition to sending the wastewater to Outfall 001, the water can also be sent to the Hopewell Regional Wastewater Treatment Plant to prevent the pond from overflowing. This discharge is permitted by the Hopewell Regional Wastewater Treatment Plant (IUP#13).

Outfall 002 is located on the East side of the Hopewell Power Station, approximately 100 feet south of the entrance gate. Outfall 002 receives storm water runoff from the northeast portion of the facility's property. Numerous drains collect the storm water which is piped to Outfall 002. Drains located within the northwest portion of the facility, which include the previous coal unloading, storage, and handling area, are not connected to this storm water system.

Outfall 003 is located on the South side of the Hopewell Power Station. Outfall 003 receives storm water runoff from the area around biomass storage pile. The perimeter of the biomass storage pile is equipped with a drainage ditch which drains into a retention basin for solids removal. The retention basin overflow discharges into the site's perimeter ditch prior to leaving the site.

Outfall 004 is located on the South side of the Hopewell Power Station. Outfall 004 receives storm water runoff and drains the area around the biomass unloading (tipper) and scale / access road. In general, the access road and the area around the tippers drain into a retention basin for solids removal.

DESCRIPTION OF SIGNIFICANT MATERIALS

Water Treatment Chemicals:
The chemicals for the cooling water treatment are located in the cooling water chemical treatment building. The chemicals for the boiler feed water treatment are located in the turbine/boiler building. These chemicals are in storage tanks, approximately 400-gallon capacity, which are placed on concrete pads within a concrete curbed/floor area. Secondary containment is used around the chemical totes. The concrete floor and curbed area will contain any spill or leaks from entering the drain systems or leaving the building. Should a spill occur, it would be contained and pumped into another container.

The water treatment chemicals for the holding pond are kept in the chemical building in storage tanks. These chemicals are dispensed automatically depending on the pH of the pond wastewater using control valves to maintain permit limits. The storage tanks are located within secondary containment to contain any spills or leaks. The chemicals are handled within the building. They are not exposed to storm water.

TABLE 1

LIST OF WATER TREATMENT CHEMICALS

Chemical Name	Purpose	Manufacturer
Cooling Water		
NALCO 900005	Biocide	NALCO
3DT104	Corrosion inhibitor	NALCO
Sulfuric Acid	pH control	Dominion Chemical
TOWER BROM 991	Biocide	NALCO
3DT177	Corrosion Inhibitor	NALCO
TOWER BROM 960	Biocide	NALCO
Sodium Bisulfite	Chlorine removal	BetzDearborn
Main Boilers Feedwater		
BT 3400	Boiler Treatment chemical	NALCO
PT2000	Boiler Treatment chemical	NALCO
ELIMIN OX	Dissolved oxygen scavenger	NALCO
Sodium Hydroxide	pH stabilizer	VWR CHEMICAL
NALCO Pre-Tect 2040HP*	Boiler Treatment chemical	NALCO
NALCO 1700*	Dissolved oxygen scavenger	NALCO
Coal Pile Runoff Pond		
Caustic Soda	pH Control	Dominion Chemical
Sulfuric Acid	pH Control	Dominion Chemical

***The main will have Nalco Pre-Tect 2040HP added replacing PT2000, and Nalco 1700 replacing ELIMIN OX.**
NOTE: Chemicals are subject to change based on operating conditions of the station.

Pesticides and Fertilizers:
Household grade pesticides are used in accordance with manufacturer's instructions and in limited quantities on small areas around the station. Household grade fertilizers are used at various locations on site.

Raw Materials:
Biomass replaced coal as the largest individual raw material used onsite. Biomass is delivered to the plant via trucks. The fuel storage area is exposed to storm water; however, it is designed such that the storm water runoff will be directed to a lined detention basin and the discharge permitted by the VPDES permit.

Diesel fuel is stored and used onsite. The storage tanks are located either in a concrete diked area or in a double walled tank. A manually operated pump is used to drain the containment area after a rain event. The contained rainwater is visually inspected and the water pumped to the oil water separator for treatment.

TABLE 2

LIST OF MATERIALS AND WASTE PRODUCTS

Material	Purpose	Waste Product
Biomass	Primary fuel in Main Boiler	Wood Ash (Fly and Bottom Ash)
Pebble Lime	Flue Gas Desulfurization/ SO_2 Air Emission Control	Lime Washdown Wastewater
Diesel Fuel	Secondary fuel in No. 1 Auxiliary Boiler and fuel for heavy equipment, emergency fire pump, and emergency feed water pump	No measurable waste product is generated from the use of Diesel Fuel
Miscellaneous Solvents, Detergents, Paints, Cleaners and Lubricating Oil	Various plant operations	Small amounts of waste

Disposal of Solid Waste:
The separated waste oil from the oil water separator is collected and transferred to an 80-gallon tank located within the fuel/oil containment area. The tank is regularly pumped out and the material is hauled off-site for recycling by a licensed waste hauler.

The majority of the solid waste generated onsite will be wood ash or bottom ash. Wood ash generated by the facility is conveyed by a fully enclosed vacuum system to a receiver bin on the ash silo. The ash silo is equipped with cyclone receivers and a bag house filter to control particulate/fugitive emissions. The wood ash is distributed to farmers as a soil amendment. The conditioning system in the silo wets the ash to minimize fugitive dust emissions. The trucks enter the ash load-out enclosure and the ash is discharged from the silo to the truck. The bottom ash is conveyed via a wet system from the boilers to a de-

watering pad. After de-watering, the bottom ash is loaded into 20 yard roll off containers for disposal at a non hazardous landfill. The storm water runoff from the ash load-out area is routed to the Holding Pond (previous coal pile runoff pond) via paved channels.

DESCRIPTION OF STRUCTURAL AND NON-STRUCTURAL CONTROL MEASURES

The Hopewell Power Station implements a Storm Water Pollution Prevention Plan that was developed in accordance with the VPDES. The storm water discharged through Outfall 002 does not receive any treatment prior to discharge. Both, Outfalls 003 and 004 include retention ponds as the primary storm water control measures. Structural control measures have been incorporated in the design and construction of the facility to reduce stormwater contact with chemicals.

The structural control measures include:

1. Containment systems (dikes, curbs, double-walled tanks, retention ponds) around storage tanks and storage areas.
2. Separate drainage system for contact and non-contact areas of the station,
3. Paved ditches and riprap areas to prevent erosion of soil, and
4. The storage and transfer of material inside buildings.

The non-structural control measures include:

1. Inspection of all storm water drainage ditches, drains, and outfalls to ensure that they are free of debris
2. Regularly scheduled inspections and maintenance of equipment to prevent leakage of material, and
3. Scheduled /unscheduled cleaning of paved areas.

ATTACHMENT 3

BAHS Wastewater Data and Evaluation

Attachment C **BASH Wastewater Data and Wasteload Allocations (ug/L) [(1)]**

Parameter	WLAacute	WLAchronic	Human Health WLA	Concentrations		Limit
Ammonia	97500	19800	NA	230	200	No
Chloride	51000000	14000000	NA	35600	35000	No
Cyanide	1300	310	NA	56	23	No
Chromium VI, dissolved	940	650	NA	620	300	**Yes**
Copper, dissolved	620	420	NA	3.0	3.0	No
Lead, dissolved	5000	570	NA	19.9	17.6	No
Selenium, total recoverable	1200	290	NA	4.3	5.7	No
Zinc, dissolved	5500	5600	NA	6.0	5.0	No

[(1)] Wasteload allocations taken from 2013 MSTRANTI spreadsheet (Attachment E to 2013 Fact Sheet)

BAHS WASTEWATER CHARACTERIZATION

Facility = Dominion Hopewell PS
Chemical = Ammonia (ug/L)
Chronic averaging period = 30
WLAa = 97500
WLAc = 19800
Q.L. = 100
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 2
Expected Value = 215
Variance = 16641
C.V. = 0.6
97th percentile daily values = 523.184
97th percentile 4 day average = 357.714
97th percentile 30 day average= 259.301
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

230
200

BAHS WASTEWATER CHARACTERIZATION

Facility = Dominion Hopewell PS
Chemical = Chloride (ug/L)
Chronic averaging period = 4
WLAa = 51000000
WLAc = 14000000
Q.L. = 10000
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 2
Expected Value = 35300
Variance = 4485924
C.V. = 0.6
97th percentile daily values = 85899.6
97th percentile 4 day average = 58731.7
97th percentile 30 day average= 42573.6
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

35600
35000

Chromium VI, dissolved

BAHS WASTEWATER CHARACTERIZATION

Facility = Dominion Hopewell PS
Chemical = Chromium VI, dissolved (ug/L)
Chronic averaging period = 4
WLAa = 940
WLAc = 650
Q.L. = 50
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 2
Expected Value = 460
Variance = 76176.0
C.V. = 0.6
97th percentile daily values = 1119.37
97th percentile 4 day average = 765.343
97th percentile 30 day average= 554.784
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 940
Average Weekly limit = 940
Average Monthly LImit = 940

The data are:

620
300

BAHS WASTEWATER CHARACTERIZATION

Facility = Dominion Hopewell PS
Chemical = Cyanide (ug/L)
Chronic averaging period = 4
WLAa = 1300
WLAc = 310
Q.L. = 10
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 2
Expected Value = 39.5
Variance = 561.69
C.V. = 0.6
97th percentile daily values = 96.1199
97th percentile 4 day average = 65.7197
97th percentile 30 day average= 47.6391
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

56
23

BAHS WASTEWATER CHARACTERIZATION

Facility = Dominion Hopewell PS
Chemical = Copper, dissolved (ug/L)
Chronic averaging period = 4
WLAa = 620
WLAc = 420
Q.L. = 2
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 2
Expected Value = 3
Variance = 3.24
C.V. = 0.6
97th percentile daily values = 7.30025
97th percentile 4 day average = 4.99137
97th percentile 30 day average= 3.61815
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

3.0
3.0

BAHS WASTEWATER CHARACTERIZATION

Facility = Dominion Hopewell PS
Chemical = Lead, dissolved (ug/L)
Chronic averaging period = 4
WLAa = 5000
WLAc = 570
Q.L. = 2
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 2
Expected Value = 18.75
Variance = 126.562
C.V. = 0.6
97th percentile daily values = 45.6265
97th percentile 4 day average = 31.1960
97th percentile 30 day average= 22.6134
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

19.9
17.6

BAHS WASTEWATER CHARACTERIZATION

Facility = Dominion Hopewell PS
Chemical = Selenium, total recoverable (ug/L)
Chronic averaging period = 4
WLAa = 1200
WLAc = 290
Q.L. = 3
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 2
Expected Value = 5
Variance = 9
C.V. = 0.6
97th percentile daily values = 12.1670
97th percentile 4 day average = 8.31895
97th percentile 30 day average= 6.03026
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

4.3
5.7

BAHS WASTEWATER CHARACTERIZATION

Facility = Dominion Hopewell PS
Chemical = Zinc, dissolved (ug/L)
Chronic averaging period = 4
WLAa = 5500
WLAc = 5600
Q.L. = 5
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 2
Expected Value = 5.5
Variance = 10.89
C.V. = 0.6
97th percentile daily values = 13.3837
97th percentile 4 day average = 9.15084
97th percentile 30 day average= 6.63329
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

6
5

ATTACHMENT 4

Owner Comments